Paper No. 16

UNITED STATES PATENT AND TRADEMARK OFFICE

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BEFORE THE BOARD OF PATENT APPEALS
AND INTERFERENCES

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Ex parte RAHMAT A. SHOURESHI

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Appeal No. 1997-1573
Application 08/276,551

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ON BRIEF

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Before HAIRSTON, JERRY SMITH and RUGGIERO, Administrative
Patent Judges.

RUGGIERO, Administrative Patent Judge.

DECISION ON APPEAL

This is a decision on appeal from the final rejection of

claims 1, 2, 4, 7 through 9, 15, and 16. Claims 3 and 6 have

been canceled. Claims 17-24 have been allowed. Claims 5 and

10 through 14 have been indicated by the Examiner as

containing

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allowable subject matter but are objected to as being

dependent on a rejected base claim[1].

The claimed invention relates to an active vibration

control system for controlling vibrations resulting from an

excitation source acting on a structure. The control system

includes a controller connected between an output sensor and a

reaction force actuator with the controller including a system

identifier for developing a relationship between the sensor

output and the reaction force. More particularly, Appellant

indicates at page 23 of the specification that the system

identifier includes a Hopfield based neural network for

learning the dynamics of the structure and for providing

output signals that follow the state variables of the

structure.

Claim 1, the only independent claim on appeal, is

illustrative of the invention and reads as follows:

_____

[1] In a communication (paper no. 15) filed May 25, 1999,
Appellant indicates a request to withdraw claims 5, 10 through
14 and 17 through 24 from the application. The issue of the
merits of this request is moot since these claims are either
allowed or indicated as containing allowable subject matter
and are therefore not before us in this appeal.

1.   An active vibration control system for controlling
vibrations at a structure resulting from at least one
         excitation force acting upon the structure,
comprising:

          at least one actuator located at the structure for
          imparting a reaction force to the structure;
          at least one sensor located away from said actuator,
          said at least one sensor producing a sensor output;
          a controller connected between said at least one
sensor   and said at least one actuator, said controller
          including:

          a system identifier for receiving said sensor
          output from said at least one sensor and
deriving   a relationship between said sensor
output and said   reaction force imparted to the
structure by said   at least one actuator; and

          an optimal controller connected to said system
          identifier to receive said relationship and for
          developing control driving signals from said
          relationship for driving said at least one
             actuator;

          said system identifier including a Hopfield based
          neural network for learning the dynamics of the
             structure represented in a state space form and
for   providing output signals that follow state
variables of   the structure.

     The Examiner relies on the following prior art[2]:

Bozich et al. (Bozich)   5,386,689   Feb. 07, 1995
                                              (Filed Oct. 13, 1992)

     Claims 1, 2, 4, 7 through 9, 15, and 16 stand finally

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     [2] The Examiner has additionally relied on admissions of
the prior art at page 23 of Appellant's specification.

rejected under 35 U.S.C. § 103 as being unpatentable over

Bozich in view of the "well known prior art[3]."

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[3] Although not explicitly stated in the sentence setting
forth the basis for the 35 U.S.C. § 103 rejection, it is
apparent from the Examiner's discussion at page 6 of the
Answer that the phrase "well known prior art" is intended to
refer to Appellant's admissions regarding the Hopfield neural
network at page 23 of the specification.

Rather than reiterate the arguments of Appellant and the Examiner, reference is made to the Brief and Answer for the respective details thereof.

OPINION

We have carefully considered the subject matter on appeal, the rejection advanced by the Examiner and the evidence of obviousness relied upon by the Examiner as support for the rejection. We have, likewise, reviewed and taken into consideration, in reaching our decision, Appellant's arguments set forth in the Brief along with the Examiner's rationale in support of the rejection and arguments in rebuttal set forth in the Examiner's Answer.

It is our view, after consideration of the record before us, that the evidence relied upon and the level of skill in the particular art would not have suggested to one of ordinary skill in the art the obviousness of the invention as set forth in claims 1, 2, 4, 7 through 9, 15, and 16. Accordingly, we reverse.

In rejecting claims under 35 U.S.C. § 103, it is incumbent upon the Examiner to establish a factual basis to support the legal conclusion of obviousness. See In re Fine,

837 F.2d 1071, 1074, 5 USPQ2d 1596, 1598 (Fed. Cir. 1988).

In so doing, the Examiner is expected to make the factual

determinations set forth in Graham v. John Deere Co., 383 U.S.

1,

17, 148 USPQ 459, 467 (1966), and to provide a reason why one

having ordinary skill in the pertinent art would have been led

to

modify the prior art or to combine prior art references to

arrive

at the claimed invention. Such reason must stem from some

teaching, suggestion or implication in the prior art as a

whole

or knowledge generally available to one having ordinary skill

in

the art. Uniroyal Inc. v. Rudkin-Wiley Corp., 837 F.2d 1044,

1051, 5 USPQ2d 1434, 1438 (Fed. Cir.), cert. denied, 488 U.S.

825 (1988); Ashland Oil, Inc. v. Delta Resins & Refractories,

Inc., 776 F.2d 281, 293, 227 USPQ 657, 664 (Fed. Cir. 1985),

cert. denied, 475 U.S. 1017 (1986); ACS Hosp. Sys., Inc. v.

Montefiore Hosp., 732 F.2d 1572, 1577, 221 USPQ 929, 933 (Fed.

Cir. 1984). These showings by the Examiner are an essential

part

of complying with the burden of presenting a <u>prima</u> <u>facie</u> case

of

obviousness. Note <u>In re Oetiker</u>, 977 F.2d 1443, 1445, 24

USPQ2d

1443, 1444 (Fed. Cir. 1992).

With respect to independent claim 1, the Examiner

proposes to modify the vibration control system disclosed by

Bozich which includes a neural network controller which

performs system identification and optimal control functions

but lacks any disclosure of utilizing a Hopfield based neural

network. To address this deficiency, the Examiner turns to

Appellant's admissions as to the prior art Hopfield neural

network beginning at line 23 of page 13 of Appellant's

specification. The Examiner's line of reasoning is set forth

at page 6 of the Answer as follows:

> Since the Hopfield based neural network and
> the neural network taught by Bozich are both
> directed to the art of self learning control
> systems for abating noise and vibration, the
> Hopfield neural network would have been
> recognized by one of ordinary skill in the
> art as an art equivalent. Therefore, it would
> have been obvious to replace the neural network
> of Bozich with the Hopfield network for the

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purpose [sic, of] using a self learning control
system for abating vibrations and noise for
increased comfort in the cabin of a vehicle.

In response, Appellant's arguments (Brief, page 3) are
primarily directed to the contention that the Examiner has
failed to establish a prima facie case of obviousness since no
support for the Examiner's assertion of functional equivalence
has been provided. After careful review of the prior art in
light of the arguments of record, we agree with Appellant that
the Examiner has not established support for a conclusion of
art recognized functional equivalence. The mere fact that the
claimed Hopfield neural network and Bozich's neural network
are used for the same purpose as asserted by the Examiner
(Answer, page 6, ". . . are both directed to the art of self
learning control systems for abating noise and vibration, . .
.") does not establish art recognized functional equivalence.
In order to rely on equivalence as a rationale for supporting
an obviousness rejection, the equivalency must be recognized
in the prior art, and cannot be based on applicant's
disclosure or the mere fact that the components at issue are
functional or mechanical equivalents. In re Ruff, 256 F.2d
590, 599, 118 USPQ 340,

348 (CCPA 1958).

Notwithstanding the Examiner's conclusion of art
recognized equivalence, the evidence of record before us
reveals fundamental distinctions between the back propagation
neural network of Bozich and Appellant's claimed Hopfield
neural network. The back propagation neural network of Bozich
employs feedforward architecture (Bozich, column 11, line 57
through column 12, line 30) while the Hopfield neural network
described beginning at page 23 of Appellant's specification
utilizes feedback architecture in which the output of each
neuron is fed back to itself as well as to other neurons in
the network. The only evidence to support any conclusion of
art recognized equivalence of these two types of neural
networks is the Examiner's own unsubstantiated statements in
the Answer. We are not inclined to dispense with proof by
evidence when the proposition at issue is not supported by a
teaching in a prior art reference, common knowledge or capable
of unquestionable demonstration. Our reviewing court requires
this evidence in order to establish a prima facie case. In re
Knapp-Monarch Co., 296 F.2d 230, 232, 132 USPQ 6, 8 (CCPA
1961); In re Cofer, 354 F.2d 664, 668, 148 USPQ 268, 271-72

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(CCPA 1966). Accordingly, since all of the limitations are not taught or suggested by the prior art, we do not sustain the obviousness rejection of independent claim 1, nor of claims 2, 4, 7 through 9, 15, and 16 dependent thereon.

In conclusion we have not sustained the 35 U.S.C. § 103 rejection of appealed claims 1, 2, 4, 7 through 9, 15, and 16. Therefore, the Examiner's decision rejecting claims 1, 2, 4, 7 through 9, 15, and 16 is reversed.

<u>REVERSED</u>

	)	
KENNETH W. HAIRSTON	)	
Administrative Patent Judge	)	
	)	
	)	
	)	BOARD OF PATENT
JERRY SMITH	)	
Administrative Patent Judge	)	APPEALS AND
	)	
	)	INTERFERENCES
	)	
JOSEPH F. RUGGIERO	)	
Administrative Patent Judge	)	

JFR:hh

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